

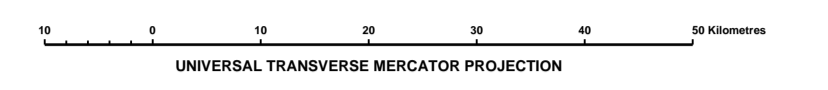
# VICTORIAN GROUNDWATER BENEFICIAL USE MAP SERIES

## North Western Victoria

### WATER TABLE AQUIFERS

BENEFICIAL USE / SEGMENT MATRIX

BENEFICIAL USE	SEGMENT (mg/L TDS)			
	A1	A2	B	C
Possible Water - desirable	0-500	501-1000	1001-3500	3501-13000
Possible Water - acceptable				Greater than 13000
Possible Mineral Water				
Irrigation				
Stock Water				
Industry				
Ecosystem Protection				
Buildings and Structures				



Published by the Department of Conservation and Natural Resources as part of the Victorian Groundwater Beneficial Use Map Series.

Compiled (1994) by J. Bartlett and H. Chaplin, Sinclair Knight Merz Pty. Ltd. (SKM) from data and information supplied by the Rural Water Corporation (RWC), VIC., the Department of Water Resources (DWR), NSW, the Australian Geological Survey Organisation (AGSO), ACT., the Department of Energy and Minerals, VIC., the Department of Conservation and Natural Resources, VIC.

Cartography by H. J. Chaplin, (SKM)

Topographic information on this map is used under agreement with the Ministry of Finance, Division of Survey and Mapping.

Data from the State Groundwater Data Base.

Boundaries derived from: Rural Water Commission, 1991, Mildura Hydrogeological Map, O'Rourke, M.E. et al. (RWC) 1992, Swan Hill Hydrogeological Map, McQuilley, C. et al. (RWC) 1992, Horsham Hydrogeological Map, Dudding, M. et al. (RWC) 1993, St Arnaud Hydrogeological Map, Dennis, A. et al. (RWC) 1993, Bendigo Hydrogeological Map, Williams, S.M. and Woolley, D. (DWR) 1992, Donington Hydrogeological Map, Redfern, J.C. (AGSO) 1993, Bairnsdale Hydrogeological Map.

This map is part of the Victorian Groundwater Beneficial Use Map Series and it is recommended that it be referred to as:

DCNR, 1995 Victorian Groundwater Beneficial Use Map Series, North Western Victoria Water Table Aquifers

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#### HYDROGEOLOGICAL UNITS

- TQs Shepparton Formation aquifer
- Qpc Blanchetown Clay
- uTa Upper Tertiary aquifer
- mTa Middle Tertiary aquifer
- pCz Bedrock aquifer

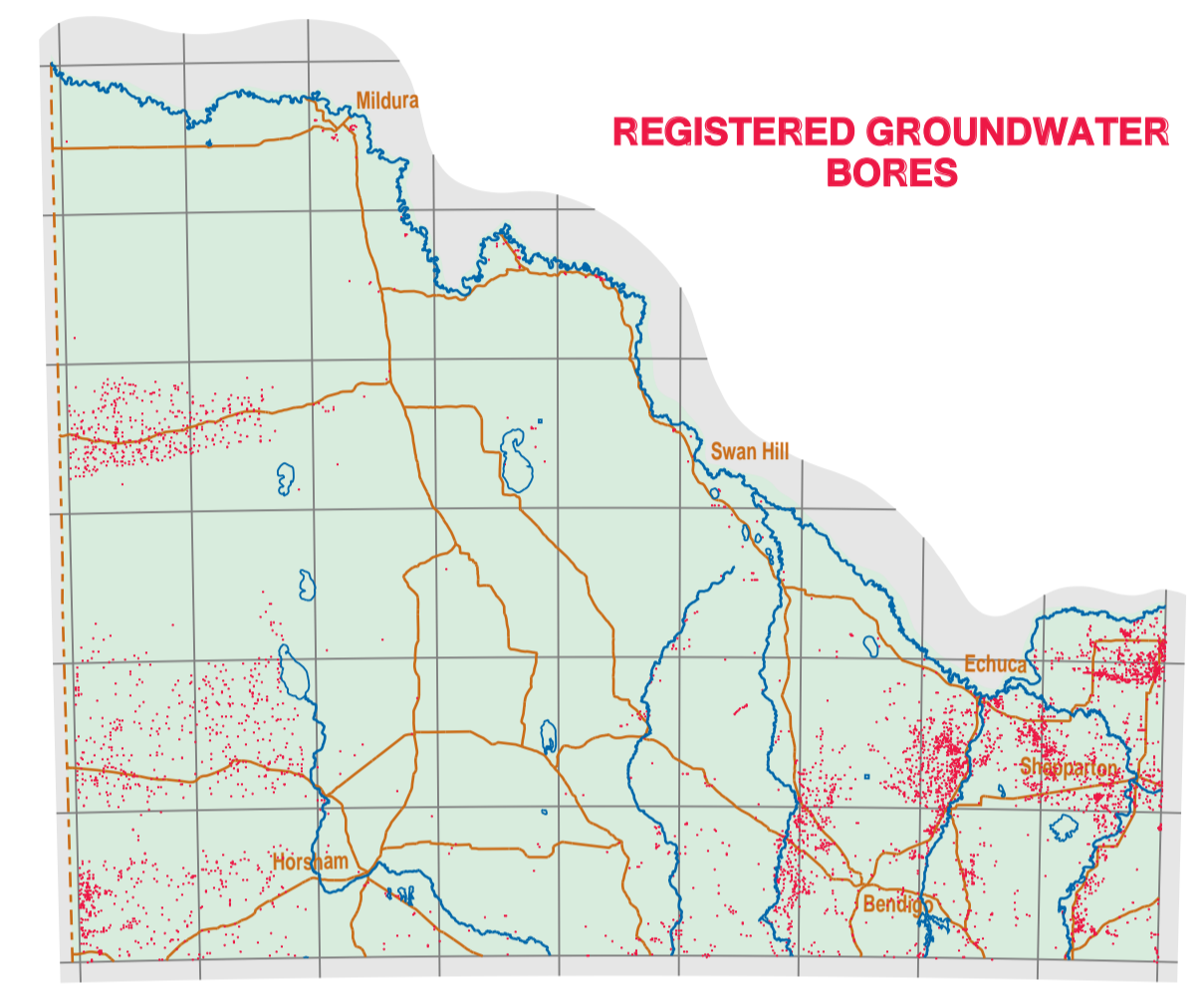
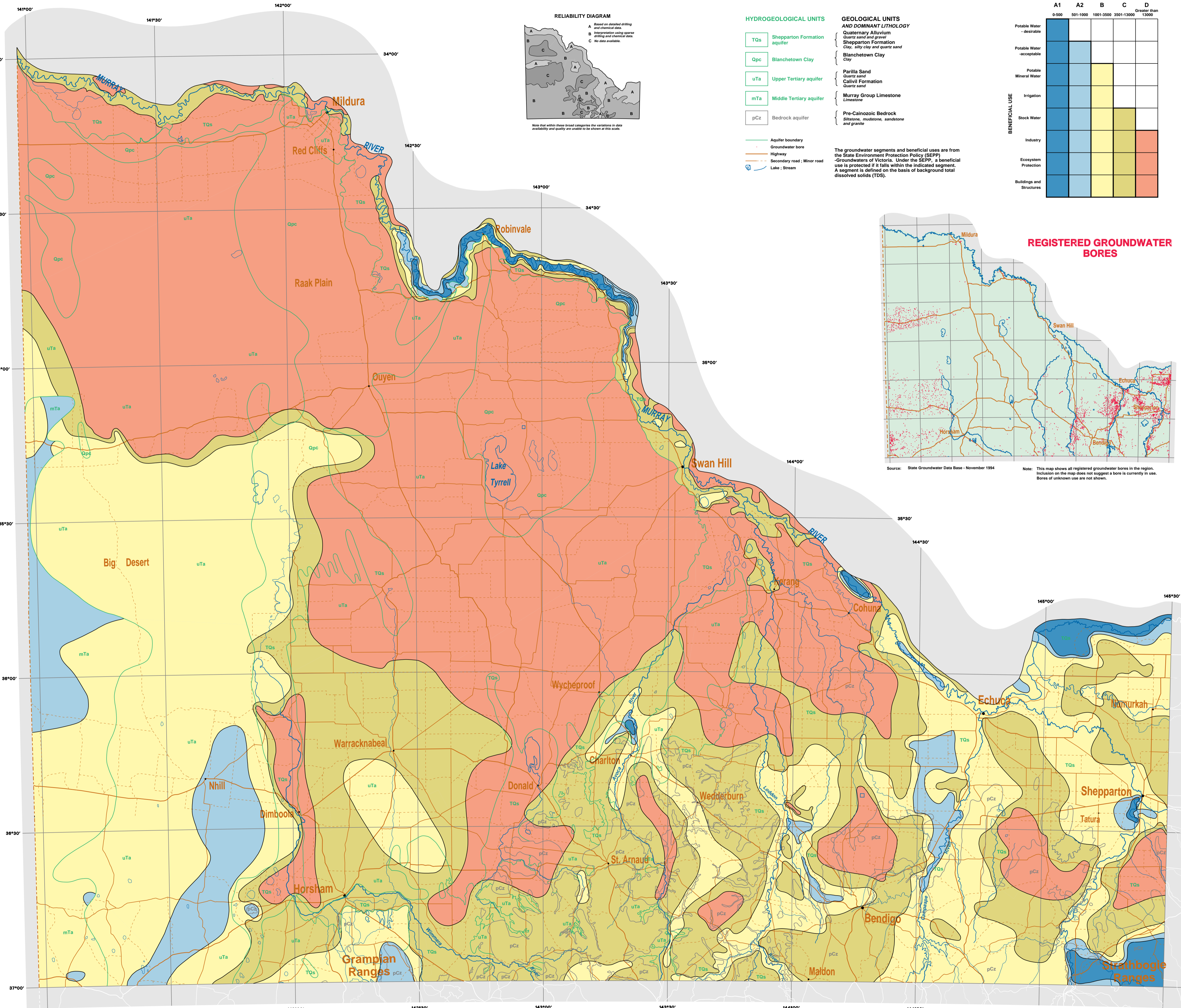
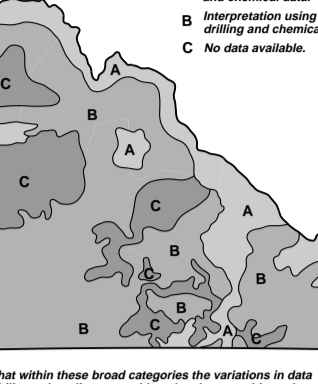
#### GEOLOGICAL UNITS AND DOMINANT LITHOLOGY

- Quaternary Alluvium
- Quartz sand and gravel
- Shepparton Formation
- Clay, silty clay and quartz sand
- Blanchetown Clay
- Clay
- Parilla Sand
- Quartz sand
- Callivil Formation
- Quartz sand
- Murray Group Limestone
- Limestone
- Pre-Cainozoic Bedrock
- Siltstone, mudstone, sandstone and granite

The groundwater segments and beneficial uses are from the State Environment Protection Policy (SEPP) - Groundwaters of Victoria. Under the SEPP, a beneficial use is protected if it falls within the indicated segment. A segment is defined on the basis of background total dissolved solids (TDS).

- Aquifer boundary
- Groundwater bore
- Highway
- Secondary road / Minor road
- Lake / Stream

#### RELIABILITY DIAGRAM



Index to adjoining sheets

#### Beneficial Use

This map is one of a series produced by HydroTechnology for the Department of Conservation and Natural Resources as part of a project to define the beneficial use of Victoria's groundwater resources.

According to the Victorian Environment Protection Authority (EPA), a beneficial use is a use of the environment, or an aspect of the environment which is conducive to public benefit, welfare, safety, health or well-being and which requires protection from the effects of waste discharges, emissions or noise. A beneficial use may be an existing or potential use. A resource may have more than one beneficial use.

The State's groundwater resources have a number of beneficial uses. These uses primarily depend on groundwater quality and aquifer yield and can be assigned to broad water quality classes.

A report produced in conjunction with this map series provides a discussion of the beneficial use concept and the implications and difficulties in assigning a beneficial use. It also details groundwater use information, discussion of the map series and the map style, groundwater protection and management and how our approach fits within National resource management.

**The Map Series**  
In this map series, we adopt the segments (salinity ranges) and beneficial use categories established in the Victorian EPA State Environment Protection Policy - Groundwaters of Victoria. Though other chemical constituents may locally affect the beneficial use, it is not possible to show this aspect on these maps.

The State is divided into three regions. Six mapsheets cover each region, with in total, six maps covering all aquifers and aquifer systems in the State.

One mapsheet shows groundwater in the water table aquifer. This aquifer may comprise a number of geological units across the region. The water table aquifer is the aquifer closest to the ground surface, with shallow aquifers at greater depths. Frequently interacting with surface water bodies, streams and wetlands.

**Existing Groundwater Use**  
The Shepparton Formation, Pliocene Sands and pre-Cainozoic aquifers are the main water table aquifers shown on this mapsheet. In contrast with the other mapsheets, few bores in north western Victoria are registered as being used solely for domestic purposes. This reflects the limited extent of possible groundwater supplies and the extensive surface water irrigation network which supplies a number of rural communities. Groundwater, however, is an important supply for irrigation, stock watering and maintenance of stream flow and surface ecosystems.

In the eastern third of the map, the Shepparton Formation may contain sites of low salinity and high yield. These areas are typically sites of valuable supply for stock watering. Small areas may contain better quality groundwater suitable for domestic use with the northern edge of the Granparan and Strathbogie Ranges containing the largest areas of possible quality water.

The areas of outcropping bedrock on the northern flanks of the Central Highlands, the Pre-Cainozoic Aquifer, consists of a range of rock types. Though of generally low to moderate yield and in places high salinity, these rocks provide a valuable supply for stock watering. Small areas may contain better quality groundwater suitable for domestic use with the northern edge of the Granparan and Strathbogie Ranges containing the largest areas of possible quality water.

In the extreme west, the water table is present in the Murray Group Limestone aquifer, which underlies the Pliocene Sands. This aquifer provides an important stock, domestic and irrigation supply south of the Big Desert. Groundwater flows from this area into South Australia, where it is also used for irrigation.

#### Using the Maps

The maps show groundwater salinity, subdivided according to the segments of the EPA SEPP. The salinity category of segment is color-coded in the beneficial use/segment matrix. The particular beneficial use (or uses) which may be protected under EPA policies under that segment is (are) indicated in the matrix. The normal beneficial use does not necessarily mean that a given use is occurring, as the use to be protected includes potential, as well as existing uses.

Salinity is a major, though not the sole, determinant of groundwater use. Other chemical parameters, the aquifer characteristics and yield considerations may also affect the beneficial use.

**Map Reliability**  
The maps show broad ranges, and sometimes generalizations have been necessary, either through a lack of data, or due to the natural complexity of groundwater flow systems or through local changes in salinity, or due to the greater scale. A reliability diagram shows the data quality.

**Note**  
Though a large amount of groundwater data has been used to produce this map series, there has not been a comprehensive investigation, registration and generalization. Hence we cannot guarantee that the mapped water quality range applies at a given location or that groundwater is suitable for a given purpose in terms of chemical composition or yield.

**Potential Groundwater Use**  
Domestic and the economic of groundwater extraction may change as surface water resources become fully available. Current water quality ranges may not apply in the future. For example, though groundwater quality may be generally unsuitable for the intended use, there may be scope for mining or simple treatment methods may improve the quality, prior to use. Groundwater may be used to provide a stand-by or emergency supply in commercial or industrial situations where water quality is not critical. In a number of circumstances however, aquifer yield, rather than water quality, may be the factor which limits future usage.

Potential use along the northern flanks of the Highlands, the bedrock aquifer and the Shepparton Formation is likely to be mainly for stock watering and emergency supplies. To the west and down west of Shepparton, groundwater will continue to be used for irrigation and to assist in water table control. Subject to local constraints there is scope for increased impoundment and commercial usage in the Murray and Southern Goulburn, Campaspe and Loddon Valleys.

As the Shepparton Formation aquifer has high variability in yield and salinity near the discharge, the mapped segments are broad regional scales. Other aspects such as diffuse and point sources of pollution may have a local impact on the beneficial use. In assessing the existing and potential beneficial uses at a given location, data at the local scale should be evaluated.

#### North Western Victoria, Water Table Aquifers

Groundwater in the water table aquifer discharges to rivers, streams and wetlands. Though discharge may be at a low rate, particularly in bedrock, saline groundwater can play a significant role in maintaining base flow in streams, and can have a major impact on surface water quality. Another use frequently considered 'use', is in terms of the water table aquifer providing recharge to deeper aquifer systems.

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